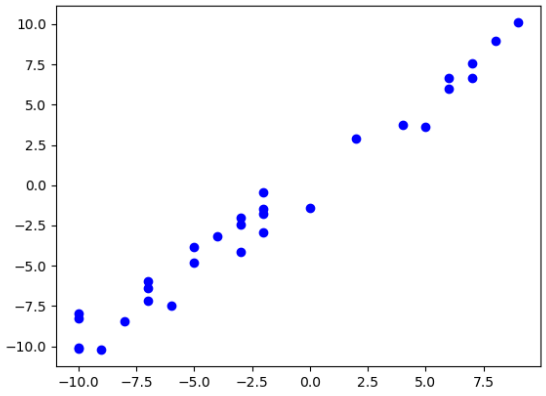
1. Determine the appropriate model for the graph of points below.



A. Linear model

B. Logarithmic model

C. Exponential model

D. Non-linear Power model

E. None of the above

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2. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 41 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 20 percent

B. About 19 percent

C. About 12 percent

D. About 3 percent

E. None of the above

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3. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 4 many cases reported, but the number of confirmed cases has quadrupled every 4 days. How long will it be until there are at least 100000 confirmed cases?

A. About 20 days

B. About 17 days

C. About 41 days

D. About 30 days

E. There is not enough information to solve the problem.

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4. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 29 liter 21 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 12 percent and 34 percent solutions, what was the amount she used of the 12 percent solution?

A. $17.14 liters$

B. $11.86 liters$

C. $14.50 liters$

D. $13.53 liters$

E. There is not enough information to solve the problem.

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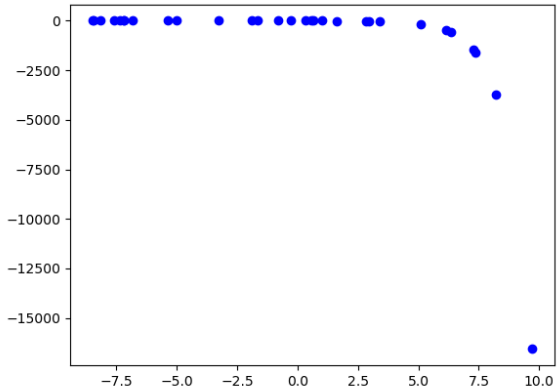
5. Determine the appropriate model for the graph of points below.



A. Linear model

B. Exponential model

C. Non-linear Power model

D. Logarithmic model

E. None of the above

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6. For the scenario below, model the rate of vibration (cm/s) of the string in terms of the length of the string. Then determine the variation constant k of the model (if possible). The constant should be in terms of cm and s.

   The rate of vibration of a string under constant tension varies based on the type of string and the length of the string. The rate of vibration of string ω increases as the square length of the string decreases. For example, when string ω is 2 mm long, the rate of vibration is 27 cm/s.

   A. $k = 675.00$

   B. $k = 108.00$

   C. $k = 1.08$

   D. $k = 6.75$

   E. None of the above.

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7. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 3 many cases reported, but the number of confirmed cases has tripled every 5 days. How long will it be until there are at least 100000 confirmed cases?

A. About 28 days

B. About 48 days

C. About 53 days

D. About 27 days

E. There is not enough information to solve the problem.

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8. For the scenario below, find the variation constant k of the model (if possible).

In an alternative galaxy, the square of the time, T (Earth years), required for a planet to orbit Sun χ increases as the cube of the distance, d (AUs), that the planet is from Sun χ increases. For example, when Ea's average distance from Sun χ is 2, it takes 70 Earth days to complete an orbit.

A. $k = 39200.000$

B. $k = 6.641$

C. $k = 4.028$

D. $k = 612.500$

E. Unable to compute the constant based on the information given.

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9. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 36 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that

the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 11 percent

B. About 18 percent

C. About 3 percent

D. About 17 percent

E. None of the above

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10. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 19 liter 15 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 7 percent and 19 percent solutions, what was the amount she used of the 7 percent solution?

A. $8.99 liters$

B. $12.67 liters$

C. $9.50 liters$

D. $6.33 liters$

E. There is not enough information to solve the problem.
